

A320-X

ATSU TUTORIAL

AUA303: LOWW - EKCH

Revision Date: 21MAY19



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This tutorial covers the entire workflow for the use of all available datalink features within the A320-X simulation. It is purposely based on the same flight that was covered with the basic tutorial flight, which guides the user from A to B using all necessary steps to fly the aircraft using a realistic workflow.

So this tutorial builds on that knowledge, giving those people an advantage who are new to the A320-X and want to dive into the datalink functionality as soon as possible.

Experienced A320-X users may use this tutorial to guide them through the workflow necessary when using all datalink systems, while using their previous knowledge on operating the A320.

Things you need to know in order to be able to complete this tutorial:

- How to use a flight planning tool to create an Operational Flightplan (OFP).
- How to fly the A320 using standard operating procedures as shown in the Basic Tutorial as well as the Standard Operating Procedures document.
- If you use Active Sky: How to set the software to use historical weather data.
- If you use GSX: The basic handling of GSX and its selection menus.

This tutorial not only covers datalink features, but also the interaction between the flight deck and the cabin, as well as communication between ground handling and the flight deck, if GSX is used.

USEFUL ADD-ON SOFTWARE

Below are listed some recommendations for additional software to enrich your simulation experience. However, none of these are required to complete the tutorial flight. They are merely recommendations for more realism.

Active Sky Weather

Most datalink features are perfectly usable without any external weather tool. This tutorial was created using a snapshot of a historical weather, so if you use ActiveSky, you can plan the flight and use this tutorial with the same numbers as shown on the screenshots.

Note however that climb-, cruise- and descend wind download is not available without ActiveSky.

Active Sky for Prepar3D v4 – ASP4

By HiFi Simulation Technologies - www.hifisimtech.com

GSX - Ground Handling Tool

Ground Services X is a comprehensive tool simulating all ground handling around an aircraft before and after each flight. This tutorial works fine without the use of GSX, as Flight Sim Labs has developed its own simulation of a ground handling process where necessary.

However, if GSX is used, all ground handling can be accomplished without having to open any Prepar3D menu or the need to open, connect or remove something manually. Simply follow the workflow as you would on the real aircraft, and GSX will interact with the A320-X to provide a seamless, easy yet realistic workflow.

Ground Services X - GSX

By FSDreamteam - www.fsdreamteam.com

Flight Planning Tool

To best experience the extent of the datalink features modelled, Flight Sim Labs recommends using one of the following programmes, capable of producing Operational Flightplan files (OFP).

You may use all datalink features without the use of an OFP. However, a good amount of data will have to be entered manually into the ATSU/AOC system, whereas the real aircraft would automatically fill those fields with data obtained from the OFP being downloaded into the FMGC.

Professional Flight Planner X

PFPX can be purchased directly at the FlightSimSoft website:

www.flightsimsoft.com

SimBrief

SimBrief can be accessed for free at the following website:

www.simbrief.com

FLIGHT PREPARATION

Setting up P3D and the FSL A320

Start Prepar3D and on the opening screen select the following items before loading the simulator:

1. VEHICLE: **FSLabs A320-X** with **CFM** engines.
2. LOCATION: **LOWW** (Vienna), **Gate G46** (or Gate D22 when using FlyTampa scenery)
3. TIME AND SEASON: **January 30th, 2019**, time of day **14:20h LT**

Press 'OK' to load the simulation.

4. If the A320 loads with engines running, open the MCDU and go to the panel state options. Then select the **"ON GPU"** panel state.

The A320 is now placed at gate D22, or in case of the default P3D scenery somewhere near that gate (since the default scenery, unfortunately, is incomplete and outdated).

Flight Planning

Some key data to use for creating the OFP with the flight planning software of your choice, in order to get the same or similar data as shown in this tutorial:

- Planned ZFW: 61.0t
- Aircraft type: A320 with CFM engines
- Flight AUA303, STD 14:10h UTC
- Departure: LOWW / Destination: EKCH / Alternate: ESMS
- Route LOWW to EKCH via:
- LANUX L858 HDO M725 GERGA T239 PEROM T298 MONAK
- Departing runway: 11, SID: LANUX1A
- STAR and approach: MONAK1M, ILS approach RWY 04L
- Cruise Level: FL360

With this data in mind, go ahead and create the OFP accordingly. When done, export the OFP file to the following folder: [Public Documents]\FSLabs Data\Routes

Weather

To recreate the weather and wind data in your OFP, use the following ActiveSky weather:

Active Sky
Historical Weather

Date and time:
Jan 30th 2019, 13:20h UTC

If Active Sky is not used, set the weather at your convenience, with the following suggestions in mind, to at least approximate some of the data:

- Surface wind: 120°/13kts
- Surface temperature: 1° C
- Altimeter setting: 1000 hPa

Important This tutorial uses historical weather through ActiveSky. If historical weather is used, you must set the ATSU weather source to 'HIFI'. See the Introduction Guide's ATSU chapter for more details on how to configure this.

Whenever you use real time weather you may wish to use NOAA as weather source, to allow for SIGMET and forecast data to be received.

AIRCRAFT PREPARATION

After the aircraft is initialised at the gate, using the 'ON GPU' panel state, external power is connected, chocks are in place, the aircraft is empty. If you check the MCDU options payload page, you see that there's no payload on board except the crew.

For things to look and feel realistic, you'd want the jetway to be connected to the open L1 door. With GSX in use, you may trigger the ground services without having to open any menu. Simply "talk" to the ground crew:

- Select 'INT' with the INT/RAD switch on the Audio Control Panel (ACP) **(1)** to simulate talking to the ground crew. This will trigger de-boarding with GSX and therefore move the jetway (or stairs) to the aircraft.

- Since the aircraft is empty already due to the 'ON GPU' panel state, the GSX de-boarding process will be finished rapidly. There is no other way to have GSX activated before starting the actual boarding process.

Note: If GSX is not used, move the jetway manually using the CTRL+J keys, or via the SODE menu.

- While looking at the ACP, you may want to turn on the 'CAB' **(2)** and 'PA' **(3)** volume buttons. The first one is necessary to talk to the cabin, the second one helps keeping track of the boarding process later on.



The aircraft is now ready to begin cockpit preparation.

COCKPIT PREPARATION

Start doing your usual cockpit preparation flow. Using datalink services such as ATSU does not change the workflow, it simply inserts a few extra steps necessary for flight preparation. Steps the previously could not be simulated realistically, since without datalink it was all based on pieces of paper passed between people.

One important new item to consider is time. The Flight Sim Labs datalink-based flight preparation workflow is coded to be used together with realistic time intervals between the various steps necessary. However, there is no need for concern. In a simulated environment, nobody is getting mad at you when you miss your scheduled departure time, no passengers stop booking your airline due to missed connections. But simply trying to make the scheduled time specified in the airline's timetable gives you a new dimension of realism.

That being said, having loaded the scenario at 14:20h local time, it is now a few minutes passed that time, and the flight AUA303 is scheduled to depart (meaning start the pushback) at 15:10h LT.

So start doing your cockpit preparation workflow, and use the following procedure as an add-on to what you are already used to doing.

Flightplan download and datalink initialisation

The first step to get things going is to import the Operational Flight Plan (OFP) you have created earlier in your flight planning tool. This will download a vast amount of data regarding your flight, which is then used by various systems, like the FMGC and ATSU.

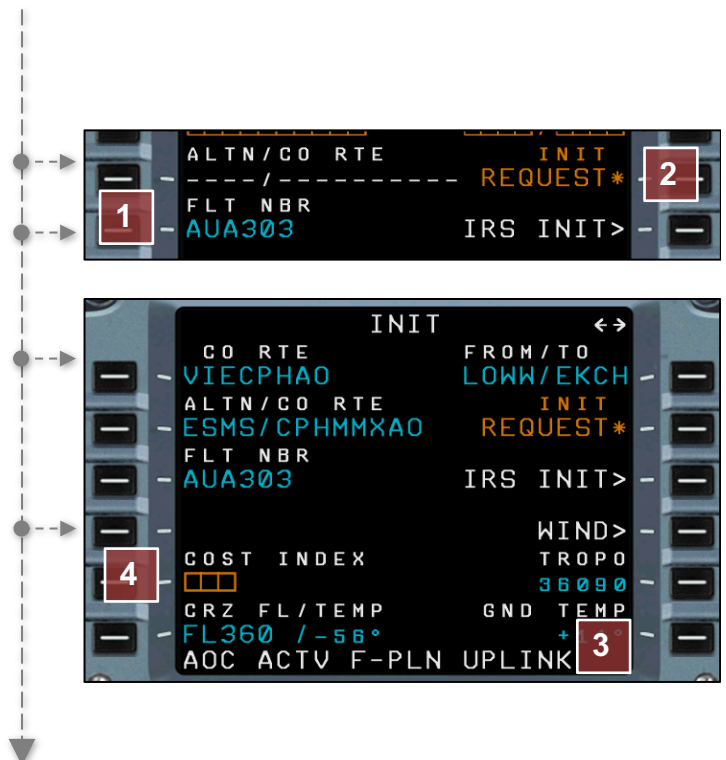
Please note that you **can** use ATSU without creating OFPs first. However, this will mean that you have to type in a lot of data manually into the AOC pages within ATSU.

- OFP Download

Press the INIT key on the MCDU to access the FMGC's **INIT** page

- Enter the flight number of today's flight, in this case '**AUA303**' (1).
- Press 'INIT Request*' to initiate the OFP download into the FMGC (2).
- Check for all fields being filled, except cost index, and the uplink being confirmed by the "AOC ACTV F-PLN UPLINK" message (3).

While on the INIT page, enter the cost index (4) used for this flight, which is **20**.



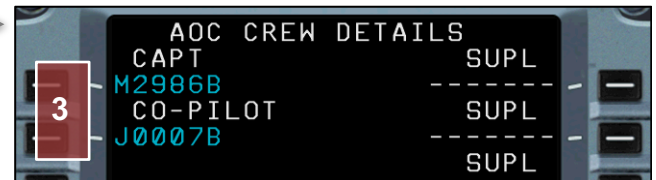
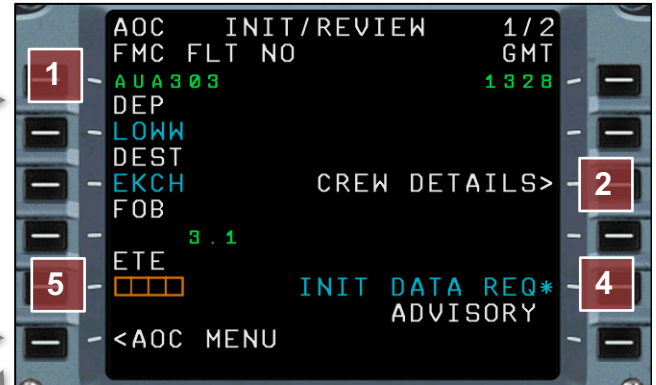
The next step is to initialise the AOC system, that part of ATSU used for information message exchange. ATSU is also accessed via the MCDU, so press the 'MCDU MENU' page to leave the FMGC.

There select 'ATSU' followed by 'AOC MENU'.

- AOC INIT

Of all available AOC pages, the AOC **INIT** page should always be the first one to work through.

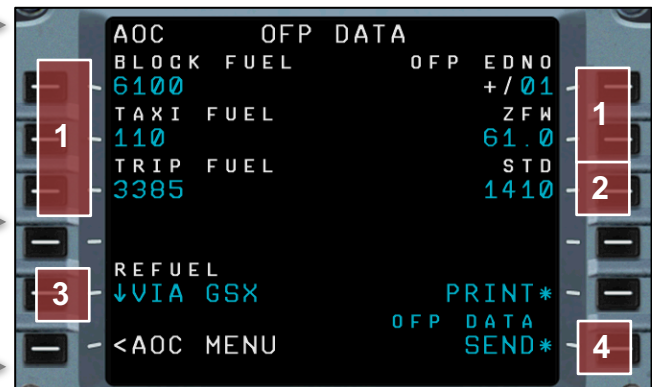
- Looking at the AOC INIT page you can see that some data has already been filled through that OFP download from the previous step. To complete the initialisation, first enter the flight number, you may use either ICAO or IATA format, so for today use 'AUA303' (1).
- Next select 'CREW DETAILS' (2).
- Enter the designator for captain and first officer, you may use any alpha-numerical designator (3).
- Return to the previous page and press 'INIT DATA REQ*' (4). This will then insert the estimated time enroute (ETE) (5).



- OFP DATA

The **OFP DATA** page is used to confirm the data from your OFP. Sending this data will provide information to various ground handling stations, such as fuel order and loadsheet calculation.

- Confirm all data corresponds to your OFP (1). Carefully check the STD time (2). Make sure it is the correct one, in this case 14:10h UTC. However, if for some reason you'll not be able to meet the STD, you can add the amount of minutes you need.
- Select the desired refuelling method (3). Choose 'VIA GSX' if GSX is used, otherwise use 'AUTOMATIC' to simulate the refuelling process internally.
- Select 'OFP DATA SEND' (4). This will, among other things, trigger the GSX refuelling process.



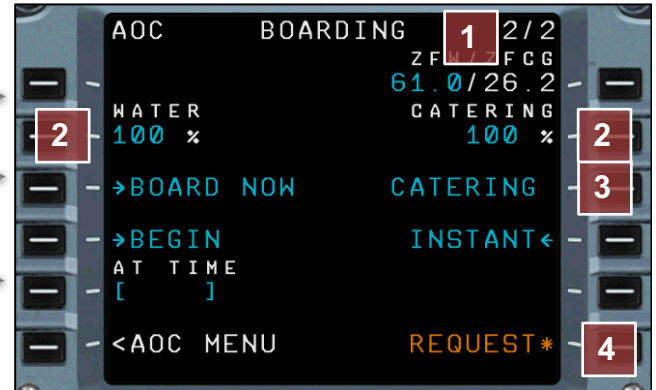
- BOARDING

It's too early for passenger boarding, however what we do need at this stage is catering, water and waste tank servicing. This can be done while being refuelled and must be finished before passengers arrive.

- In the AOC MENU select the '**BOARDING**' page. Then select 'REQUEST' with the LKS 6R to get to the 2nd boarding page (1).
- Type in the amount of water and catering you require (2), and then select the 'CATERING' option (3).
- Hit 'REQUEST' (4) to send the catering request to the appropriate company.

If GSX is used, then the GSX catering process is triggered.

If you do not use GSX, then you can load catering manually on the MCDU options payload page.



A short while later, things around your aircraft might look like this:



While fuel, catering and water is being loaded, you do have some moments available for important system and FMGC preparation tasks, such as:

- Align the three ADIRUs
- Check the FMGC flightplan and enter missing bits such as arrival- and approach segments.

Timing and Boarding

By now you should have received your first company message.

- SLOT NOTIFICATION

- On the AOC MENU page select **'RECEIVED MESSAGES'** (1) to see the list of messages.
- You will see one message labelled "NEW" (2). This message is sent to inform you about the departure slot.
- The slot notification message includes the following details from top to bottom (3):
 - Flight Number / Departure / Destination
 - Flightplan release number, usually 1 if it is the first version.
 - Calculated Take-Off Time (CTOT)
 - Estimated Off-Block Time (EOBT)
 - Delay, if any:
 - AW = Weather delay, can occur with low visibility, snow or strong winds.
 - AX = ATC delay
 - EN = Enroute delay, this would usually be delay due to airway congestion.
 - Estimated taxi time



If no delay is indicated, the EOBT will equal your STD. In any case, you need to be ready for pushback at the specified EOBT.

This is a good time to think about when you want the passengers to start boarding the aircraft. You should aim for boarding to start around 25 minutes before start-up. You can start as early as 40 minutes before EOBT. The minimum time required would be 15 minutes, anything less than that will probably delay departure.

For this flight, let's plan for boarding to start 30 minutes prior departure:

- BOARDING

On the AOC MENU page select **'BOARDING'**. This page allows you to send a message to ground handling, as to when you would like to start the boarding process.

- Type the desired boarding time into the scratchpad (1), then select the empty brackets below 'BEGIN AT TIME' (2).
- Select 'REQUEST' to submit the message (3).
- Boarding will start at the time specified (4).
If GSX is being used, then the GSX boarding function will trigger automatically at that time. Otherwise an internal boarding simulation will gradually add passengers to the aircraft.



Note: If for some reason the actual UTC time you see is already past 13:40h, you may select 'BOARD NOW' instead.

Weather Information

At this time, you'll probably be waiting for the preliminary loadsheet to arrive. The perfect moment to get some weather information downloaded.

- WEATHER DATA REQUEST

Selecting the '**ATIS/WX**' page (1) within the AOC menu enables you to get weather information. Being on ground before departure, Vienna is already selected as the station you want data from.

- Press '**METAR**' (2) to receive metar data.
- SIGMET- and forecast data (3) is not available if ActiveSky is set as the weather source, which is required if you want to use real weather from a past date.
- Type in any other airport and/or airspace identifier to get weather data from those stations (4). You must first insert the 4-letter code, then select the type of data you want.



Note: Weather source must be set to 'NOAA' in order to receive SIGMET and forecast data. See the Introduction Guide for more information on how to switch weather sources.

- DEP ATIS (Optional)

Selecting '**DEP ATIS**' on the AOC menu page (1) will request the departure ATIS to be sent immediately.

- This **needs a connection to an online ATC** provider, and requires that ATC station to have an ATIS information published. If not available, use VHF to listen to the ATIS broadcast.



Note: Once airborne, that prompt in the AOC menu will change to 'ARR ATIS' and will deliver the ATIS for the arrival airport if selected.

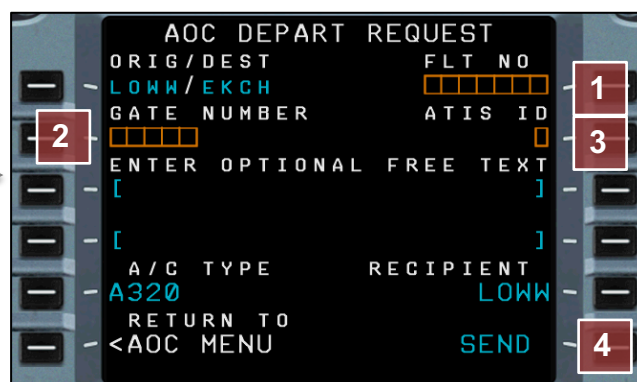
PDC – Pre-Departure Clearance (Optional)

One more thing you can do right now, **if you are connected to online ATC**, you may request the PDC, the pre-departure clearance. If you are not flying using online ATC, then request the clearance as usual via VHF.

- ATC REQ

Selecting '**ATC REQ**' on the AOC menu page, then 'PRE-DEP CLRNC', allows you to request the PDC:

- Some flight details are already filled in, so enter 'AUA303' as the flight number (1), your gate number (2), the ATIS info you have read or listened to (3), and then hit 'SEND' (4).
- After you have received the PDC as a message, you need to accept it, then this will send a message to ATC, confirming that you have accepted the PDC.



Note: The online network controller needs to use the ACARS system to be able to answer your PDC request.

Loadsheet

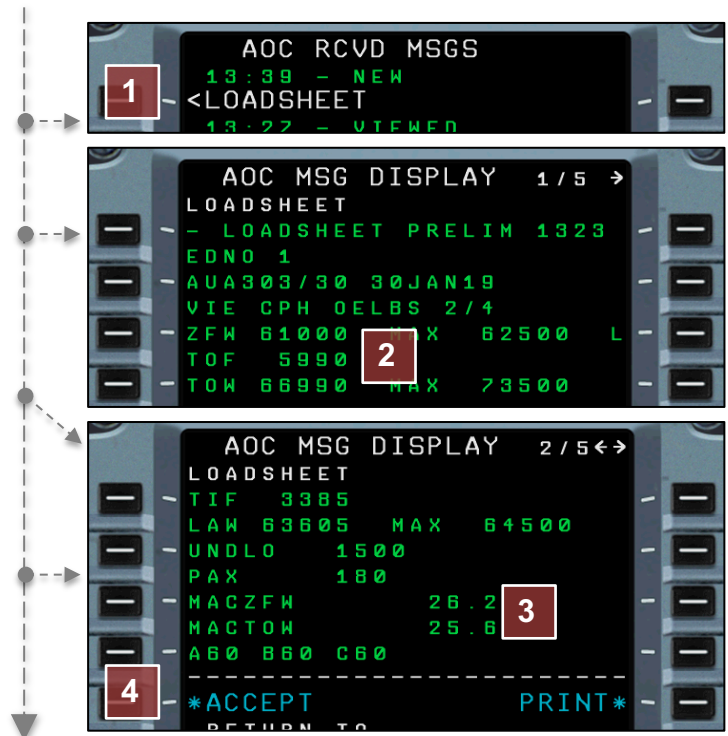
Check your ATSU messages to see if the loadsheet has arrived. Once it has, open it and check all its pages:

- LOADSHEET

The loadsheet contains all the data you need to complete the FMGC's **INIT B** page.

- Select the loadsheet among the received messages (1).
- Page 1 of the loadsheet will show you the weight data needed for departure (2).
- Page 2 gives you the ZFW CG and the TOW CG (3).
- Look through the remaining pages of the loadsheet, then accept it by pressing the LSK 5L (4).
- Fill in the ZFW and ZFWCG on the FMGC's INIT B page.

Note: This is only a preliminary loadsheet. The final loadsheet will be sent to you after boarding has completed.



Fuel Report

With refuelling completed, on the AOC menu page you will see the figure "6" next to the 'FUEL'-prompt. This means that the refuelling operator has uplinked a fuel report for you to confirm and send to your airline.

The fuel report contains a lot of numbers concerning the fuel that was ordered. However, it is pretty much self-explanatory and can be confirmed quickly:

- FUEL

- Select the 'FUEL'-page from the AOC menu (1).
- Confirm the fuel quantity before refuelling started (2) and the fuel on board now (3). Calculate the difference, convert it to volume and compare with the report (4).
- Austrian Airlines calculates in litres (5). To confirm the fuel, multiply the weight of the fuel you got added with the density factor (6). 0.8 is sufficient, it does not have to be more precise.
- If the value is the same as the one on the report (4), type it into the scratchpad and insert it at 'VOLUME' (7).
- Send the report (8).



Note: Your actual fuel load may differ from the figures shown here, depending on your calculations for the OFP you created.

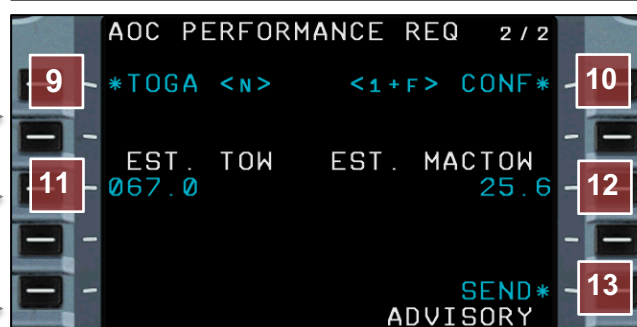
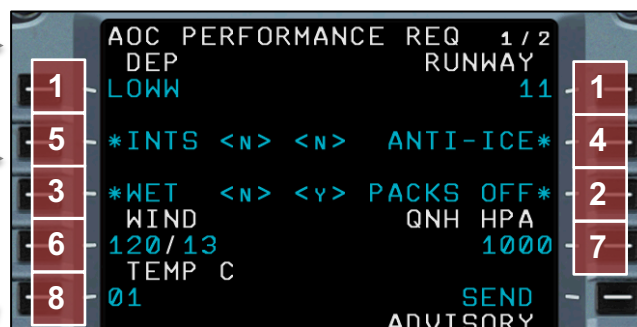
Take-Off Performance Data

With the loadsheet in our hands, we can use ATSU to obtain take-off performance data. Filling out the necessary pages will send that data to our airline's computers, and then send take-off data back to our aircraft.

- PERF REQ

Select the '**PERF REQ**' page within the AOC menu. Then fill in the details as follows:

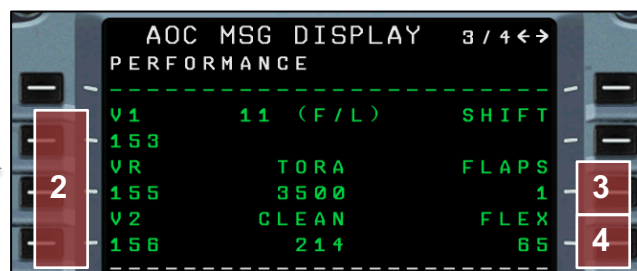
- Departure airport and runway (1).
- Confirm that packs off departure is set to yes (<y>) (2). All other options are not required, meaning that with the weather scenario mentioned at the beginning of this tutorial, the runway is neither wet (3), nor is anti-ice required (4), due to lack of visible moisture. Intersection departure is also not needed (5).
- Fill in the surface wind (6), QNH (7) and temperature (8) from the ATIS.
- TOGA thrust is not required (9), and we want flaps config '1+F' (10).
- Put in the estimated take-off weight (11) and MACTOW (12), taken from the preliminary loadsheet.
- Send the data (13).



- PERFORMANCE

Moments later you'll see the performance data amongst the list of messages (1).

- Select the message and use the arrow keys to flip through all pages. Part of the message contains the data on which the calculations are based. Page 3 shows you the take-off speeds (2), flaps (3) and flex thrust setting (4).
- Open the FMGC take-off PERF page on the other MCDU and enter the take-off data there.



Flightplan Route Fine-Tuning

The last item related to datalink exchange is the completion of your flightplan route. This can be done late in the cockpit preparation flow to ensure that you get as up-to-date wind data as possible.

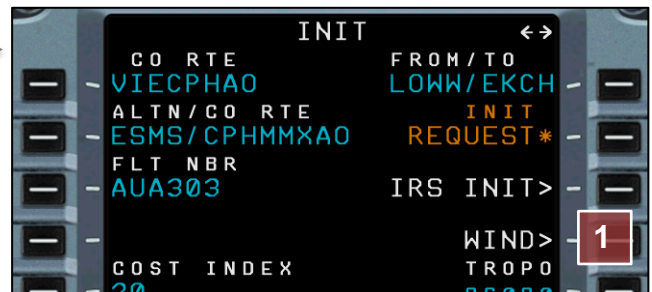
Before requesting wind data, ensure the following:

- FMGC INIT B page must be filled out completely, to allow vertical path calculation.
- Complete the flightplan if necessary, including the STAR and approach. The STAR is necessary to get accurate descend wind data, and the approach helps to have the FMGC ETA and EFOB prediction calculated as accurate as possible.
- Use the approach that is most likely to be flown, given the weather, route and time of day. For this example, I have chosen an ILS approach for runway 04L.

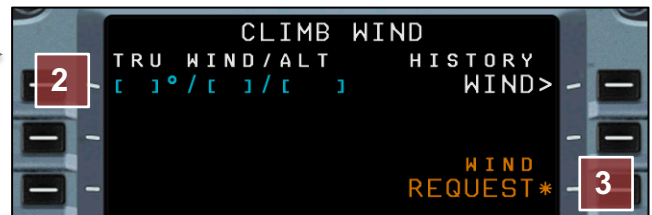
- WIND REQUEST

With the flightplan confirmed to be complete, wind data can be obtained.

- Open the FMGC's **INIT** page and select 'WIND>' (1).

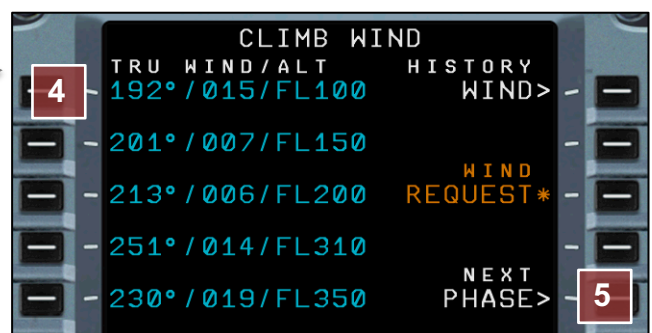


- Note that no wind data is present (2). Select 'WIND REQUEST*' (3) to get data. Note that this will take several minutes to arrive.



- You'll see an uplink message in the scratchpad, once the wind data has arrived.

- With wind data downloaded (4), you can select 'NEXT PHASE>' (5) to cycle through the other flight segments, cruise and descent.



- Within the cruise wind phase use the arrow keys to cycle through each route waypoint if desired.
- Note that you can request new wind data whenever you like.

Finalising Cockpit- and Flight Preparation

By this time, refuelling is completed, and the seat-belt signs can be turned on. Boarding might still be ongoing, so you can complete your cockpit preparation flows.

With cockpit preparation completed and passenger boarding coming to an end, here's some items to observe and take care of:

- Cabin crew will announce the completion of the boarding process via the passenger announcement system (PA).
- A short time later, the L1 door will be closed by cabin crew.
- Make sure that you are running on APU power at this time.
- With all doors closed, instruct the cabin crew to arm the evacuation slides. Right-click the 'PA'-button on the ACP for around 3-4 seconds. Observe all slides showing as armed on the lower ECAM door page.

With boarding completed, expect the final loadsheet to arrive at any moment:

- The final loadsheet will inform you about any changes in weight **(1)** and passenger load **(2)**.
- Also take note of the final centre of gravity numbers **(3)**.
- Update the FMGC INIT B page accordingly.
- Accept the final loadsheet **(4)**.
- Use the MACTOW CG value to set the stabiliser trim for departure.



If you're running behind schedule, processing the final loadsheet may also be done during pushback or taxi.

ON THE MOVE

Gate Departure / Pushback

With the aircraft ready for push-back, all that is needed to get underway is talking to the ground crew. With the clearance for pushback obtained, you may follow these steps to have a realistic flow for gate departure:

- Turn on the beacons.
- If GSX is used, select the INT/RAD switch from neutral to 'INT' a second time. This will trigger GSX to start the pushback procedure. Follow the instruction received by the ground crew.
- If no GSX is used, simply release the parking brake and use SHIFT-P for pushback.

After engine start, do all the necessary cockpit flows and checklists. As soon as you start to taxi, take a moment to go to the AOC menu page. If you select 'INIT', then the arrow keys for page 2, you may take note of the following data:

- Door closure time has been filled, and so has off-block time. Furthermore, the block time has started counting.



Take-off

While taxiing to the runway, you may listen in on the PA channel if you want to, usually the volume is turned down considerably, so that you don't get distracted in your workflow.

At some point before reaching the runway, it may be that the only item on your checklist is the cabin report. Depending on the equipment used, this report is being delivered solely by an ECAM message, by a phone call, or both of them.

If a buzzer sounds:

- Make sure that the 'CAB' channel is active and the volume setting sufficient (1).
- Press the flashing transmission selector for 'CAB' (2) to answer the phone call.
- After the call is completed, select to transmit on 'VHF1' (3).
- Press the 'RESET' button (4) to clear the call light.



- If you arrive at the runway holding point and the cabin has not yet reported ready, cycle the no-smoking sign OFF and ON again, or press the FWD call button. This will give a signal to the cabin crew to hurry up.

Having done all that, take off and proceed with the flight as usual.

Before Landing

At any time before landing, you may request up-to-date weather data via the AOC ATIS/WX page.

If you are using one of the “Airline Packs” available in the forum’s download section, one of the files installed contains a list of all gates used at the airports serviced by that particular airline.

In that case you will receive a company message towards the end of your flight, notifying you of the gate to be used at the destination. Having received that information will enable you to determine the best exit taxiway to use, and to plan your landing accordingly.

Later during the approach, the cabin crew will again inform you once the cabin is ready. Expect to receive an ECAM memo and/or a intercom phone call.

After Landing

At any convenient time after landing, access the AOC INIT page again, to review the flight and send a report:

- Landing time **(1)**, on-block time **(2)**, and block time **(3)** are shown.
- Enter the ID of the pilot that performed the landing **(4)**. Then select if this has been an autoland **(5)**.
- Send the flight report **(6)**.



- Arriving at the gate, you can start the de-boarding process by selecting once more ‘INT’ with the INT/RAD-switch on the Audio Control Panel.
- If GSX is used, the GSX de-boarding process is initiated.
- If no GSX is present, an internal de-boarding process is started, removing the payload gradually to simulate cargo and passengers being unloaded.
- After having sent the flight report above, head over to Hoppie’s ACARS website to see the flight report: www.hoppie.nl/acars/system/log.html

This flight report includes time-, fuel- and landing data.

DEBRIEFING

If you arrived at this page after having completed your first flight using ATSU, or you might just have read through the document in preparation, you might probably be terrified about the added complexity to a normal routine flight. If this is the case, you don't need to worry. After you have done the ATSU flow a couple of times, it will feel perfectly natural and you'll perceive it as something that makes work much easier, because it allows you to have all necessary data at hand.

This ATSU-centred workflow allows for a seamless interaction between you in the flight deck, your cabin crew behind you, and the ground handling personnel outside. It allows you to experience airliner operations as it is done in today's modern world, paperless and with the aircraft linked in a chain of computers which are all delivering and receiving data to make life easier for every person involved.

If you want to do your own flight next, you may still use this document as a guide, as the steps remain the same for each flight, only the data changes accordingly.